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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---------------------------|-------------|----------------------|---------------------|------------------|
| 10/827,097 | 04/19/2004 | Richard N. Codos | LPPT-13B2 | 1465 |
| 26875 | 7590 | 10/18/2005 | EXAMINER | |
| WOOD, HERRON & EVANS, LLP | | | TRAN, LY T | |
| 2700 CAREW TOWER | | | | |
| 441 VINE STREET | | | ART UNIT | PAPER NUMBER |
| CINCINNATI, OH 45202 | | | 2853 | |

DATE MAILED: 10/18/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | |
|------------------------------|-----------------|-------------------|
| Office Action Summary | Application No. | Applicant(s) |
| | 10/827,097 | CODOS, RICHARD N. |
| | Examiner | Art Unit |
| | Ly T. TRAN | 2853 |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on ____.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1,9,12,15 and 19-49 is/are pending in the application.
- 4a) Of the above claim(s) 19-25,29,30 and 41-44 is/are withdrawn from consideration.
- 5) Claim(s) ____ is/are allowed.
- 6) Claim(s) 1,9,12,15,26-28,31-35,38-40 and 45 is/are rejected.
- 7) Claim(s) 36,37 and 46 is/are objected to.
- 8) Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on ____ is/are: a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. ____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) Notice of References Cited (PTO-892)
- 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 4/12/05, 3/7/05.
- 4) Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) Notice of Informal Patent Application (PTO-152)
- 6) Other: ____.

DETAILED ACTION***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 9, 12 14, 27, 28, 31, 34, 35, 39, 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Codos et al. (USPN 6,312,123) in view of Ort (USPN 4,340,893) and Jackson (New cold-curing high performance UV system).

With respect to claim 9, Codos et al. discloses:

- Substrate support defining a substrate supporting plane (Fig1: element 15)
- At least one ink jet print head on the carriage (Fig.1: element 30, 15, Column 4: line 21-29)
- At least one UV curing head on the carriage sufficiently close to the ink jet print head and the UV curing head being configured to emit sufficient UV energy to cure the ink jettied onto the substrate, at least partially cure, a substrate formed of such a material, so that the surface of the material being printed upon does not move from the plane for printing (Column 4: line 53-58, Column 7: line 14-15).
- Heating station (Fig.1: element 26)

With respect to claims 1 and 27, 28, 31, Codos et al. discloses an apparatus and a method of ink jet printing with UV curable ink on a substrate comprising:

- Moving a print head carriage having an ink jet print head thereon approximately parallel to a substrate (Fig.1: element 30, 15, Column 4: line 21-29)
- Jetting ink from the heads across the predetermined distance onto the surface of the substrate (Column 4: line 29-33)
- Provide at least one UV curing assembly on the carriage oriented to direct UV energy onto the surface of the substrate sufficiently close to where ink is being jetted onto the surface and UV assembly being effective to substantially cure the ink (Column 4: line 53-58, Column 7: line 14-15).

Codos does not specifically teach a print head track extending parallel to the plane having a print head carriage moveable, while Codos teaches print heads (30) are transversely moveable across the frame (11) and may be moveable on the frame under the power of a transverse drive (31), it would have been obvious to one having skill in the art to have a print head track in order to move the print head, controller is operate to activate the UV curing head and the UV curing head is moveable relative to the plane and maintain focus of UV light from the printhead on ink jetted onto the surface of the substrate (Fig.1, Column 4: line 53-67).

However, Codos fails to teach cold UV curing head on the carriage and moveable with the print head and cold UV includes a limited bandwidth UV source, a

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reflector and a fluid cooling system and power consumption of at least 200 watts per linear inch.

Ort does not specifically teach UV head on the carriage. While Ort teaches two dryer on the carriage and moveable with the print head (Fig.2: element 44, 45, Column 2: line 10-17, line 35-38) in order to provide for bi-directional printing.

It would have been obvious to one having ordinary skill in the art at the time the invention was made with at least one curing head adjacent to and moveable with the print head as taught by Ort. The motivation of doing so is in order to provide for bi-directional printing.

Jackson teaches using cold UV to curing ink (page 8), reflector and cooling system (page 8, figure 1), and power consumption of at least 200 watts per linear inch (Page 8: column 3). Since Jackson teaches using the cold UV to cure the ink, the substrate have to deform as it move in direction of print head and since the combination teach the UV cold, the same UV light would achieve the same effect such as to freeze the ink on the surface of the substrate without impinging radiation that would materially deform the substrate.

It would have been obvious to one having ordinary skill in the art at the time the invention was made as modify to use cold UV as taught as Jackson. The motivation of doing so is to improve product quality.

2. Claim 45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Codos et al. (USPN 6,312,123) in view of Anon (Taming UV temperature).

With respect to claim 45, Codos et al. discloses:

- Moving a print head carriage having an ink jet print head thereon approximately parallel to a substrate (Fig.1: element 30, 15, Column 4: line 21-29)
- Substrate support defining a substrate supporting plane (Fig1: element 15)
- UV curing head on the carriage to direct UV energy toward the substrate (Column 4: line 53-58, Column 7: line 14-15).

However, Codos fails to teach the power consumption of at least 125 watts per linear inch.

Anon teach the power consumption of at least 125 watts per linear inch (page 19).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have the power consumption of at least 125 watts per linear inch as taught by Anon. The motivation of doing is to obtain more economy curing.

3. Claim 47 is rejected under 35 U.S.C. 103(a) as being unpatentable over Codos et al. (USPN 6,312,123) in view of Anon (Taming UV temperature) as applied to claim 45 above, further in view of Ort (USPN 4,340,893) and Jackson (New cold-curing high performance UV system).

The combination of Codos and Anon fails to teach two lamps, one n each side of the print head and emit light of at least 200 watts per linear inch.

Ort does not specifically teach UV head on the print head. While Ort teaches two dryer on the carriage and moveable with the print head (Fig.2: element 44, 45, Column 2: line 10-17, line 35-38) in order to provide for bi-directional printing.

It would have been obvious to one having ordinary skill in the art at the time the invention was made with at least one curing head on the carriage to and moveable with the print head as taught by Ort. The motivation of doing so is in order to provide for bi-directional printing.

Jackson teaches power consumption of at least 200 watts per linear inch (Page 8: column 3). It would have been obvious to one having ordinary skill in the art at the time the invention was made as modify to have the power consumption as taught by Jackson. The motivation of doing so is to improve product quality.

4. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Codos et al. (USPN 6,312,123) in view of Ort (USPN 4,340,893) and Jackson (New cold-curing high performance UV system) as applied to claims 9 and 14 above, further in view of Aoki et al (USPN 5,864,352).

The combination of Codos, Ort and Jackson fails to teach a blower.

Aoki et al teaches a blower (Fig.1: element 307, Column 14: line 1-37).

It would have been obvious to one having ordinary skill in the art at the time the invention was made as modify to have a blower as taught by Aoki. The motivation of doing so is to blow the heat on the printing medium therefore prevent failure in image fixation.

5. Claim 32 is rejected under 35 U.S.C. 103(a) as being unpatentable over Codos et al. (USPN 6,312,123) in view of Ort (USPN 4,340,893) and Jackson (New cold-curing high performance UV system) as applied to claim 31 above, further in view of Pelletier (USPN 5,447,758).

Codos disclose the claimed invention except that printing on the substrate such that printing on the paper instead of cardboard. Pelletier shows that paper and cardboard is an equivalent structure known in the art. Therefore, because paper and cardboard were art recognized equivalents at the time the invention was made, one of ordinary skill in the art would have found it obvious to substitute cardboard for paper for the same purpose such as using as a printing medium.

6. Claim 48 is rejected under 35 U.S.C. 103(a) as being unpatentable over Codos et al. (USPN 6,312,123) in view of Anon (Taming UV temperature) as applied to claim 45 above, further in view of Mitani et al (USPN 5,896,154).

The combination of Codos, and Anon fails to teach the vacuum.

Mitani teaches the vacuum (Fig.1: element 33, 32).

It would have been obvious to one having ordinary skill in the art at the time the invention was made as modify to have the vacuum as taught by Mitani. The motivation of doing so is to keep the substrate remain on the surface of the support member, therefore improving the print quality.

7. Claims 9, 14, 27, 28, 31, 34, 35, 39, 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Codos et al. (USPN 6,312,123) in view of Ort (USPN 4,340,893) and Jackson (New cold-curing high performance UV system) in view of Mitani (USPN 5,896,154).

The combination of Codos, Ort and Jackson fails to teach the vacuum.

Mitani teaches the vacuum (Fig.1: element 33, 32).

It would have been obvious to one having ordinary skill in the art at the time the invention was made as modify to have the vacuum as taught by Mitani. The motivation of doing so is to keep the substrate remain on the surface of the support member, therefore improving the print quality.

Allowable Subject Matter

8. Claims 36,37 and 46 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 36, 37 and 46 are allowable over prior art of record because at least the prior art of record has not been found to anticipate or teach a hollow tube, substantially transparent to UV radiation, substantially absorbent of infrared radiation and formed of a temperature and radiation tolerant material, the tube extending the length of the head and being positioned between the at least one lamp and the substrate. And a second fluid cooling system coupled to the tube to remove heat energy from the infrared radiation by the tube.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ly T. TRAN whose telephone number is 571-272-2155. The examiner can normally be reached on M-F (7:30am-5pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Meier can be reached on 571-272-2149. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

LT

October 14, 2005



Stephen D. Meier
Primary Examiner